

Appendix H

CHART Assessment for the Upper Columbia River Steelhead ESU

CHART Participants

The CHART for this ESU consisted of the following NOAA Fisheries biologists: Dale Bambrick (CHART Leader), Dennis Carlson, Kale Gullett, and Lynn Hatcher. CHART members also included Ken McDonald from the U.S. Forest Service and Jim Craig from the U.S. Fish and Wildlife Service.

ESU Description

The Upper Columbia River steelhead ESU was listed an endangered species in 1997 (62 FR 43937; August 18, 1997). The ESU includes all naturally spawned populations of steelhead in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border (62 FR 43937; August 18, 1997). The agency recently conducted a review to update the ESU's status, taking into account new information, evaluating component resident rainbow trout populations, and considering the net contribution of artificial propagation efforts in the ESU. We have proposed that Upper Columbia River *O. mykiss* (steelhead and rainbow trout, inclusive) be listed as threatened (69 FR 33102; June 14, 2004). Additionally, we have proposed that the listing include resident populations of *O. mykiss* below impassible barriers (natural and manmade) that co-occur with anadromous populations (69 FR 33102; June 14, 2004). We have also proposed that the listing include six artificial propagation programs considered part of the ESU (69 FR 33102; June 14, 2004). The final listing determination for all *O. mykiss* ESUs was extended by six months (70 FR 37219, June 28, 2005), therefore the CHART's assessment focused on the anadromous range of *O. mykiss*.

Unlike Pacific salmon, steelhead are capable of spawning more than once before death. However, it is rare for steelhead to spawn more than twice before dying, and most that do so are females. Steelhead can be divided into two basic run types based on their level of sexual maturity at the time they enter fresh water and the duration of the spawning migration. The stream-maturing type, or summer steelhead, enters fresh water in a sexually immature condition and requires several months in fresh water to mature and spawn. The ocean-maturing type, or winter steelhead, enters fresh water with well-developed gonads and spawns relatively shortly after river entry. Fish in the Upper Columbia River steelhead ESU are made up entirely of summer steelhead.

Upper Columbia River steelhead spawn in cool, clear streams with suitable gravel size, depth, and current velocity. They sometimes also use smaller streams for spawning. The adult steelhead enter fresh water between May and October. During summer and fall before spawning, they hold in cool, deep pools. They migrate inland toward spawning areas, overwinter in the larger rivers, resume migration to natal streams in early spring, and then spawn. In general, adults in this ESU spawn later than in most downstream populations—often remaining in fresh water for a year before spawning.

Depending on water temperature, steelhead eggs may incubate for 1.5 to four months before hatching. Rearing takes place primarily in the faster parts of pools, although young-of-the-year are abundant in glides and riffles. Some older juveniles move downstream to rear in larger tributaries and mainstem rivers. Productive steelhead habitat is characterized by complexity—primarily in the form of large and small wood.

The dry habitat conditions in the Upper Columbia River are less conducive to steelhead survival than in many other parts of the Columbia River Basin. Although the life history of this ESU is similar to that of other inland steelhead, smolt ages are some of the oldest on the West Coast (up to seven years old), probably due to the area's cold water temperatures. The cold stream temperatures also lead to the possibility that many fish in this ESU may be thermally-fated to a resident (rainbow trout) life history regardless of whether they are the progeny of resident or anadromous parents. Most current natural production occurs in the Wenatchee and Methow River systems, with a smaller run returning to the Entiat River. Very limited spawning also occurs in the Okanogan River Basin. Most of the fish spawning in natural production areas are of hatchery origin. They limited data available indicate that smolt age in the this ESU is dominated by 2-year-olds. It also appears that steelhead from the Wenatchee and Entiat Rivers return to fresh water after one year in salt water, whereas Methow River steelhead primarily return after two years of ocean residence.

Recovery Planning Status

Five populations are identified for the Upper Columbia River *O. mykiss* ESU: the Wenatchee River, Methow River, Entiat River, Okanogan Basin, and Crab Creek populations. The Interior Columbia Basin Technical Recovery Team (ICBTRT 2003, 2005) placed these populations into a single major population grouping based on life-history type and ecological spawning zone. Recovery planning will likely emphasize the need for a geographical distribution of viable populations across the range of the ESU (Ruckelshaus et al. 2002, McElhany et al. 2003, McClure 2004 [pers comm.]). Subbasin assessments and plans have been completed for each subbasin through the Northwest

Power and Conservation Council. Recovery planners are now using those subbasin plans and TRT products to develop ESA recovery plans. Draft recovery plans are expected by the end of 2005. The CHART considered the available subbasin plans and TRT products in rating each watershed. We anticipate that, as recovery planning proceeds, we will have better information and may revise our recommendations regarding critical habitat designation.

CHART Area Assessments

The CHART assessment for this ESU addressed 10 subbasins containing 31 occupied watersheds, as well as the Columbia River rearing/migration corridor. Recovery planning will likely emphasize the need for a geographical distribution of viable populations across the range of population groupings (also called “strata”) in an ESU (Ruckelshaus et al. 2002, McElhany et al. 2003). The ICBTRT (2003, 2005) did not identify separate major groupings/strata for this ESU due to the relatively small size of the area. Therefore, as part of its assessment the CHART considered the conservation value of each HUC5 in the context of a single population group. Information is presented below by USGS subbasin because they present a convenient and systematic way to organize the CHART’s watershed assessments for this ESU and their names are generally more recognizable because they typically identify major river systems.

Chief Joseph Subbasin (HUC4# 17020005)

The Chief Joseph subbasin is located in north-central Washington and contained in Chelan, Douglas and Okanogan counties, Washington. The subbasin contains five watersheds, three of which are occupied by the ESU. These watersheds encompass approximately 817 mi² and 1,493 miles of streams. Fish distribution and habitat use data from WDFW identify approximately 42 miles of occupied riverine habitat in the watershed (WDFW 2003). The Interior Columbia Basin TRT (2003, 2005) identified two demographically independent populations (Methow River and Okanogan River) occupying this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H1 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that one of the occupied watersheds (Upper Columbia/Swamp) was of high conservation value to the ESU because it contains a high value migration corridor for the Methow River and Okanogan

River populations, connecting upstream watersheds with downstream reaches and the ocean. The other two occupied watersheds in this subbasin were of low conservation value to this ESU. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Okanogan Subbasin (HUC4# 17020006)

The Okanogan subbasin is located in north-central Washington adjacent to the U.S.-Canada border and contained entirely in Okanogon County, Washington. The subbasin contains five watersheds, all of which are occupied by the ESU. This watershed encompasses approximately 2,650 mi² and 3,928 miles of streams. Fish distribution and habitat use data from WDFW identify approximately 131 miles of occupied riverine habitat in the watershed (WDFW 2003). The Interior Columbia Basin TRT (2003, 2005) identified one demographically independent population (Okanogan River) occupying this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H2 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watersheds in this subbasin were of either high or medium conservation value to the ESU. Of the five HUC5s reviewed, two were rated as having high and three were rated as having medium conservation value. The CHART also concluded that the HUC5s with a medium overall rating contain a high value rearing and migration corridor connecting high value upstream watersheds with downstream reaches and the ocean. The CHART also believed that Loup Loup Creek (Lower Okanogan HUC5) may be occupied by this ESU based on maps/information contained in a report by the Washington State Conservation Commission and Northwest Indian Fisheries Commission (2003). Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Similkameen Subbasin (HUC4# 17020007)

The Similkameen subbasin is located in north-central Washington adjacent to the U.S.-Canada border and contained entirely in Okanogon County, Washington. The subbasin contains four watersheds, one of which (Lower Similkameen River) is occupied by the ESU. This watershed encompasses approximately 69 mi² and 167 miles of streams.

Historically occupied areas in this subbasin are now blocked by Enloe Dam. Fish distribution and habitat use data from WDFW identify approximately 4 miles of occupied riverine habitat in the watershed (WDFW 2003). The Interior Columbia Basin TRT (2003, 2005) identified one demographically independent population (Okanogan River) occupying this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H3 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied reaches in the Lower Similkameen HUC5 watershed was of high conservation value to the ESU. The CHART also concluded that historically occupied areas upstream of Enloe Dam may be essential for the conservation of the ESU. The CHART noted that a recent report describing habitat and fish conditions in this subbasin (Talayco 2002) observed that Enloe Dam blocks access to more than 95 percent of the potential anadromous fish habitat in the Similkameen River and that there is “significant potential for increasing spawning and rearing habitat available to anadromous fish in this subbasin by addressing passage barriers such as Enloe Dam.” This report also noted that “recently there has been interest in relicensing the Enloe Dam, and fish passage alternatives are being investigated.” Therefore, the CHART concluded that the ESU would likely benefit if the extant population had access to spawning/rearing habitat upstream and that these areas may warrant consideration as critical habitat. Table H2 summarizes the CHART’s PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Methow Subbasin (HUC4# 17020008)

The Methow subbasin is located in north-central Washington adjacent to the U.S.-Canada border and contained entirely in Okanogan County, Washington. The subbasin contains seven watersheds, all of which are occupied by the ESU. This watershed encompasses approximately 1,823 mi² and 6,726 miles of streams. Fish distribution and habitat use data from WDFW identify approximately 216 miles of occupied riverine habitat in the watershed (WDFW 2003). The Interior Columbia Basin TRT (2003, 2005) identified one demographically independent population (Methow River) occupying this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that

may affect the PCEs in the watersheds. Map H4 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that all of the occupied HUC5 watersheds in this subbasin were of high conservation value to the ESU. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Lake Chelan Subbasin (HUC4# 17020009)

The Lake Chelan subbasin is located in central Washington and contained entirely in Chelan County, Washington. The subbasin contains two watersheds, only one of which is occupied by the ESU. This watershed encompasses approximately 262 mi² and 970 miles of stream/lake reaches. Most of these reaches are above the Lake Chelan gorge and were likely historically inaccessible to anadromous fish. Fish distribution and habitat use data from WDFW identify approximately one mile of occupied riverine habitat in the lowermost reach of this watershed (WDFW 2003). The Interior Columbia Basin TRT (2003, 2005) did not associate a demographically independent population with this subbasin but Kaputa (2002) noted a priority management goal for the Chelan River is to provide spawning and rearing habitat for steelhead in Reach 4 (near the confluence of the Columbia River). Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H5 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watershed in this subbasin was of medium conservation value to the ESU. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Upper Columbia/Entiat Subbasin (HUC4# 17020010)

The Upper Columbia/Entiat subbasin drains the eastern Cascade Range in central Washington. Occupied watersheds in this subbasin are contained in Chelan, Douglas, Grant and Kittitas counties in Washington. The subbasin contains four watersheds, all of which are occupied by the ESU. These watersheds encompass approximately 1,491 mi² and 4,715 miles of streams. Fish distribution and habitat use data from WDFW identify approximately 185 miles of occupied riverine habitat in the subbasin (WDFW 2003).

The CHART noted that steelhead PCE distribution in the Mad River may be less than shown and only include reaches upstream to vicinity of Hornet Creek (i.e., near the upstream extent of spawning/rearing reaches shown in Map H6). However, this issue was not resolved by the time of this report. All four demographically independent populations in this ESU (Okanogan River, Methow River, Entiat River, and Wenatchee River) occupy this subbasin (ICBTRT 2003, 2005). Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H6 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watersheds in this subbasin were of high and medium (Lake Entiat) conservation value to the ESU. The CHART also concluded that while the tributary habitats in the Lake Entiat HUC5 were of medium conservation value, the HUC5 still contains a high value rearing and migration corridor connecting high value upstream watersheds with downstream reaches and the ocean. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Wenatchee Subbasin (HUC4# 17020011)

The Wenatchee subbasin drains the eastern Cascade Range in central Washington and is contained in Chelan County, Washington. The subbasin contains five watersheds, all of which are occupied by the ESU. The subbasin encompasses approximately 1,328 mi² and 4,170 miles of streams. Fish distribution and habitat use data from WDFW identify approximately 241 miles of occupied riverine habitat in the subbasin (WDFW 2003).

The CHART noted that steelhead PCEs may be more extensive than identified in the WDFW GIS data (WDFW 2003). The Team noted in particular that steelhead in Icicle Creek (Icicle/Chumstick HUC5) are passed above the hatchery and likely get upstream as far as the confluence of French Creek. This extended distribution is depicted in Map H7 as containing at least migration PCEs (with spawning/rearing PCEs likely as well). The Interior Columbia Basin TRT (2003, 2005) identified one demographically independent population (Wenatchee River) occupying this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H7 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watersheds in this subbasin were of high and medium conservation value to the ESU. Of the five HUC5s reviewed, four were rated as having high and one (Icicle/Chumstick) was rated as having medium conservation value. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Moses Coulee Subbasin (HUC4# 17020012)

The Moses Coulee subbasin is located in central Washington and contained in Douglas and Grant counties, Washington. The subbasin contains two watersheds, one of which (Rattlesnake Creek) is occupied by the ESU. This watershed encompasses approximately 218 mi² and 569 miles of streams. Fish distribution and habitat use data from WDFW identify approximately one mile of occupied riverine habitat in the subbasin (WDFW 2003). The Interior Columbia Basin TRT (2003, 2005) identified one demographically independent population (Wenatchee) with this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H8 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watershed in this subbasin was of low conservation value to the ESU. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Lower Crab Subbasin (HUC4# 17020015)

The Lower Crab subbasin is located in south-central Washington and occupied watersheds are contained in Adams and Grant counties, Washington. The subbasin contains eight watersheds, only one of which (Lower Crab Creek) is occupied by the ESU. This watershed encompasses approximately 400 mi² and 867 miles of streams. Fish distribution and habitat use data from WDFW identified very little occupied riverine habitat in the subbasin (WDFW 2003). However, the CHART concluded that this was inaccurate and cited distribution information in Quinn (2001) that steelhead likely spawn further upstream (approximately 54 miles) in Crab Creek. The Interior Columbia Basin TRT (2003, 2005) identified one historic demographically independent population (Crab Creek) within this subbasin. Table H1 summarizes the total number of occupied reaches

identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H9 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watershed in this subbasin was of medium conservation value to the ESU. Table H2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Upper Columbia/Priest Rapids Subbasin (HUC4# 17020016)

The Upper Columbia/Priest Rapids subbasin is located in south-central Washington and contained in Adams, Benton, Franklin, Grant, Kittitas, and Yakima counties in Washington. The subbasin contains six watersheds, three of which are occupied by the ESU. Occupied watersheds encompasses approximately 929 mi² and 1,599 miles of streams. Fish distribution and habitat use data from WDFW identify approximately 113 miles of occupied riverine habitat in the subbasin (WDFW 2003). The CHART noted that steelhead PCEs may be more extensive than identified in the WDFW GIS data (WDFW 2003). The Team noted that in the Yakima/Hansen Creek HUC5 that (1) steelhead in Hanson Creek likely spawn as far upstream as the confluence of Cottonwood Creek, and (2) steelhead in Alkali Canyon Creek likely spawn in reaches located approximately halfway to the first major fork in this drainage. This extended distribution is depicted in Map H10 as containing at least migration PCEs (with spawning/rearing PCEs likely as well). Also, two of the HUC5s (1605 and 1606) were preliminarily rated as medium but are now considered high due to their sole contribution as rearing/migration corridors (i.e., no tributary habitat). All four extant demographically independent populations identified by the Interior Columbia Basin TRT (2003, 2005) occupy this subbasin. Table H1 summarizes the total number of occupied reaches identified for each HUC5 watershed containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map H10 depicts the specific areas in this subbasin occupied by the ESU and under consideration for critical habitat designation.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the occupied HUC5 watersheds in this subbasin were of high (Yakima/Hansen Creek) and medium (Middle Columbia/Priest Rapids and Columbia River/Zintel Canyon) conservation value to the ESU. Table H2 summarizes the CHART's PCE/watershed scores and conservation

value ratings, and Figure H1 shows the overall distribution of ratings by HUC5 watershed.

Columbia River Corridor

The Columbia River rearing and migration corridor consists of that segment from the confluence of the Yakima and Columbia rivers downstream to the Pacific Ocean. This confluence is located in the Columbia River/Zintel Canyon HUC5 which was the furthest downstream HUC5 with spawning or tributary PCEs identified in the range of this ESU. Fish distribution and habitat use data from WDFW identify approximately 331 miles of occupied riverine and estuarine habitat in this corridor (WDFW 2003). This corridor overlaps with the following counties: Clatsop, Columbia, Gilliam, Hood River, Morrow, Multnomah, Sherman, Umatilla, and Wasco counties in Oregon, and Benton, Clark, Cowlitz, Franklin, Klickitat, Skamania, Wahkiakum, and Walla Walla counties in Washington.

After reviewing the best available scientific data for all of the areas within the freshwater and estuarine range of this ESU, the CHART concluded that the Columbia River corridor was of high conservation value to the ESU. The CHART noted that this corridor connects every watershed and population in this ESU with the ocean and is used by rearing/migrating juveniles and migrating adults. The Columbia River estuary is a particularly important area for this ESU as both juveniles and adults make the critical physiological transition between life in freshwater and marine habitats (ISAB 2000, Marriott et al. 2002).

Marine Areas

NOAA Fisheries' analysis focused on freshwater and estuarine habitats upstream of the mouth of the Columbia River. While marine areas are occupied by this ESU, within this vast area the agency has not identified "specific areas within the geographical area occupied by the species . . . on which are found those physical or biological features . . . essential to the conservation of the species."

Changes to the CHART's Initial Assessments

The CHART reviewed the public and peer reviewer comments received on the Team's initial findings for this ESU as well as new information relevant to evaluating habitat areas for this ESU. As a result, the CHART changed the conservation value rating for one watershed (Upper Columbia River/Swamp Creek HUC5) within the geographical area occupied by this ESU to reflect the fact that there are no tributary habitats here but there is a high value connectivity corridor. Additionally, based on public comments and new information reviewed by the CHART, we have identified changes to the delineation

of occupied habitat areas in one watershed (Nason/Tumwater HUC5). The proposed critical habitat designation (69 FR 74572, December 14, 2004) summarizes the comments and responses pertaining to the CHART's initial determinations for this ESU. And Tables H1 and H2 reflect the final CHART assessments, including the following changes in habitat area delineations:

Subbasin	Watershed code	Watershed name	Changes from Initial CHART Assessment
Chief Joseph	1702000505	Upper Columbia/ Swamp Creek	Changed conservation rating from Medium to High.
Wenatchee	1702001103	Nason/Tumwater	Removed 1 mile (1.6 km) of unoccupied stream reach.

References and Sources of Information

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- Washington State Conservation Commission and Northwest Indian Fisheries Commission. 2003. WRIA 49 Salmonid Distribution Table and maps, dated March 2003.

Table H1. Summary of Occupied Areas, PCEs, and Management Activities Affecting PCEs for the Upper Columbia River Steelhead ESU

Map Code	Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential (mi)**	Management Activities***
				Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
	Chief Joseph	Foster Creek	1702000503	0.9	0	0		A, D, Fi
	Chief Joseph	Jordan/Tumwater	1702000504	0	4.2	0		A, D, F, Fi, G, R
	Chief Joseph	Upper Columbia/Swamp Creek	1702000505	0	5.6	31.3		A, D, F, Fi, G, R
	Okanogan	Upper Okanogan River	1702000601	2.5	3	32.8		A, D, F, Fi, G, I, M, R
	Okanogan	Okanogan River/Bonaparte Creek	1702000602	0.7	0	18.9		A, D, F, Fi, G, M, R
	Okanogan	Salmon Creek	1702000603	17	0	0		A, D, F, Fi, G, I, R
	Okanogan	Okanogan River/Omak Creek	1702000604	0	0	27.2		A, D, F, Fi, G, M, R, U
	Okanogan	Lower Okanogan River	1702000605	0	2.6	25.9		A, D, F, Fi, G, R
	Similkameen	Sinlahekin Creek	1702000703	0	0	0	aa	
	Similkameen	Lower Similkameen River	1702000704	0	0	3.8	bb	A, D, F, Fi, G, M, R
	Methow	Lost River	1702000801	4.1	0	3.3		F, Fi
	Methow	Upper Methow River	1702000802	6	0	3.5		F, Fi, G, I
	Methow	Upper Chewuch River	1702000803	0	0	19.7		F, Fi, R
	Methow	Lower Chewuch River	1702000804	25.8	<0.1	3.3		A, D, F, Fi, G, R, I
	Methow	Twisp River	1702000805	29.7	0	9.4		F, Fi, G, R, I
	Methow	Middle Methow River	1702000806	57.9	0.1	4.6		A, D, F, Fi, G, M, R, I
	Methow	Lower Methow River	1702000807	29.8	0.1	18.7		D, F, Fi, G, M, R
	Lake Chelan	Lower Chelan	1702000903	0.5	0	0.5		A, D, F, Fi, G, R
	Upper Columbia/Entiat	Entiat River	1702001001	42.7	0.9	17		F, Fi, G, R, I
	Upper Columbia/Entiat	Lake Entiat	1702001002	0	0.8	54.7		A, D, F, Fi, G, M, R, U
	Upper Columbia/Entiat	Columbia River/Lynch Coulee	1702001003	7.4	3.7	33.5		A, D, F, Fi, G, M, R

^{aa} CHART concluded that historic areas upstream of Enloe Dam to the U.S.-Canada border may be essential for ESU conservation

^{bb} CHART concluded that historic areas upstream of Enloe Dam to the U.S.-Canada border may be essential for ESU conservation

Map Code	Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential (mi)**	Management Activities****
				Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
	Upper Columbia/Entiat	Columbia River/Sand Hollow	1702001004	1.1	0	23.5		A, D, Fi, G, M
	Wenatchee	White River	1702001101	20.2	11.2	3.6		F, Fi
	Wenatchee	Chiwawa River	1702001102	37.5	4.2	0.6		F, Fi, R
	Wenatchee	Nason/Tumwater	1702001103	56.4	2.4	4.6		D, F, Fi, R
	Wenatchee	Icicle/Chumstick	1702001104	20.1	2.1	22.8		A, D, F, Fi, G, M, R, U
	Wenatchee	Lower Wenatchee River	1702001105	1	39.9	14.6		A, D, F, Fi, G, I, M, R, U
	Moses Coulee	Rattlesnake Creek	1702001204	0	0.6	0.3		A, D, Fi, G, R
	Lower Crab	Lower Crab Creek	1702001509	0	0	54.2		A, D, Fi, G, I
	Upper Columbia/Priest Rapids	Yakima/Hansen Creek	1702001604	0	0	43.2		A, D, F, Fi, G, M
	Upper Columbia/Priest Rapids	Middle Columbia/Priest Rapids	1702001605	0	0	35.5		A, Fi, G
	Upper Columbia/Priest Rapids	Columbia River/Zintel Canyon	1702001606	0	0	47.9		A, D, Fi, R, U
	Middle Columbia/Lake Wallula	Upper Lake Wallula	1707010101	0	0	11.8		C, D, I, R, T, U, W
	Middle Columbia/Lake Wallula	Lower Lake Wallula	1707010102	0	0	21.7		A, D, Fi, R
	Middle Columbia/Lake Wallula	Upper Lake Umatilla	1707010106	0	0	20.2		A, D, Fi, R, U
	Middle Columbia/Lake Wallula	Middle Lake Umatilla	1707010109	0	0	17.3		A, D, Fi, R
	Middle Columbia/Lake Wallula	Lower Lake Umatilla	1707010114	0	0	42.3		A, D, Fi, R
	Middle Columbia/Hood	Upper Middle Columbia/Hood	1707010501	0	0	14.7		A, D, Fi, G, S, R, T
	Middle Columbia/Hood	Middle Columbia/Mill Creek	1707010504	0	0	24.6		A, D, F, Fi, G, R, T, I, U

Map Code	Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential (mi)**	Management Activities***
				Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
	Middle Columbia/Hood	Middle Columbia/Grays Creek	1707010512	0	0	25.6		F, Fi, R, T
	Middle Columbia/Hood	Middle Columbia/Eagle Creek	1707010513	0	0	9.3		D, R, U
	Lower Columbia/Sandy	Columbia Gorge Tributaries	1708000107	0	0	25.8		C, D, F, R, U, W
	Multiple	Lower Columbia Corridor (Sandy/Washougal to Ocean)	NA	0	0	117.4 ^{cc}		C, D, I, R, T, U, W

* Some streams classified as “Migration/Presence PCEs” may also include rearing or spawning PCEs, but the GIS data are still undergoing review to confirm additional habitat use types.

** These watersheds contain unoccupied habitat that historically supported spawning and rearing PCEs. The CHART determined that these habitat areas/watersheds may be essential for conservation of the ESU. Since these watersheds are unoccupied, the CHART did not identify management activities.

*** This list is not exhaustive. It is intended to highlight key management activities affecting PCEs in each watershed. Activities identified are based on the general categories described by Spence et al. (1996) and summarized previously in the “Special Management Considerations or Protection” section of this report. Coding is as follows: F= forestry, G = grazing, A = agriculture, C = channel modifications/diking, R = road building/maintenance, U = urbanization, S = sand and gravel mining, M = mineral mining, D = dams, I = irrigation impoundments and withdrawals, T = river, estuary, and ocean traffic, W = wetland loss/removal, B = beaver removal, X = exotic/invasive species introductions, H = forage fish/species harvest. Primary sources for this information were the CHART and reports by Andonaegui (1999, 2000, 2001, and 2003), Quigley et al. (2001), and land use/land cover GIS layers from the U.S. Geological Survey.

^{cc} The Lower Columbia River from the ocean upstream approximately 46.5 miles is considered to contain estuarine PCEs, in addition to migration and rearing (ISAB 2000).

Table H2. Summary of Initial CHART Scores and Ratings of Conservation Value for Habitat Areas in HUC5 Watersheds Occupied by the Upper Columbia River Steelhead ESU

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Chief Joseph	Foster Creek	1702000503	1	1	1	1	0	1	5	Low-moderate HUC5 score; this HUC5 contains part of the historic Sanpoil TRT demographically independent population. There is a small amount of spawning habitat in this watershed.	Low
	Chief Joseph	Jordan/Tumwater	1702000504	1	1	1	1	0	1	5	Low-moderate HUC5 score. This HUC5 is within the lower most section of the historic Sanpoil River TRT demographically independent population. There is limited habitat within this watershed due to Chief Joseph Dam. Rearing/migration PCEs in this watershed provide support for a small amount of upstream spawning habitat in the Foster Creek watershed.	Low
	Chief Joseph	Upper Columbia/Swamp Creek	1702000505	1	2	1	1	2	1	8	Moderate HUC5 score; PCEs support three TRT demographically independent populations; the medium HUC5 rating pertains to reaches upstream of the Okanogon/Columbia confluence – reaches downstream of this confluence are a high value rearing/migration corridor. CHART noted that this HUC5 does not have tributary habitats and thus warranted elevating to a High conservation value due to it's importance as a connectivity corridor.	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Okanogan	Upper Okanogan River	1702000601	1	1	1	1	1	2	7	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; PCE quality in uppermost Okanogan subbasin not as high as downstream HUC5s but does contain a high value rearing/migration corridor for a high value HUC5 upstream	Medium
	Okanogan	Okanogan River/Bonaparte Creek	1702000602	1	1	1	1	1	2	7	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; PCE quality in uppermost Okanogan subbasin not as high as downstream HUC5s but does contain a high value rearing/migration corridor for a high value HUC5 upstream	Medium
	Okanogan	Salmon Creek	1702000603	1	2	2	1	1	2	9	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; this HUC5 likely contains some of the highest quality PCEs remaining for this population	High
	Okanogan	Okanogan River/Omak Creek	1702000604	1	2	2	1	1	2	9	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; this HUC5 likely contains some of the highest quality PCEs remaining for this population as well as a high value rearing/migration corridor for upstream HUC5s	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Okanogan	Lower Okanogan River	1702000605	1	1	1	1	1	2	7	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; HUC5 contains a high value rearing/migration corridor for upstream HUC5s; CHART believed that Loup Loup Creek may be occupied	Medium
	Similkameen	Sinlahekin Creek	1702000703							*	HUC5 not currently occupied so not scored; however, CHART concluded that historic areas upstream of Enloe Dam to the U.S.-Canada border may be essential for ESU conservation	Possibly High
	Similkameen	Lower Similkameen River	1702000704	1	1	1	1	2	2	8*	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART concluded that historic areas upstream of Enloe Dam to the U.S.-Canada border may be essential for ESU conservation	High
	Methow	Lost River	1702000801	2	3	3	1	2	2	13	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids as well as an ICBEMP priority area for steelhead; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Methow	Upper Methow River	1702000802	2	3	3	1	1	2	12	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High
	Methow	Upper Chewuch River	1702000803	3	3	2	1	2	2	13	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Methow	Lower Chewuch River	1702000804	3	2	2	1	2	2	12	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High
	Methow	Twisp River	1702000805	3	3	2	1	2	2	13	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Methow	Middle Methow River	1702000806	3	2	2	1	2	2	12	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids as well as an ICBEMP priority area for steelhead; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High
	Methow	Lower Methow River	1702000807	3	2	2	1	2	2	12	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; CHART considered PCEs in this and other Methow subbasin HUC5s to be of the highest quantity and quality in the range of this ESU; interim abundance targets relevant to recovery of Methow River population are the highest for the entire ESU	High
	Lake Chelan	Lower Chelan	1702000903	1	1	1	1	0	2	6	Low-moderate HUC5 score; not identified as supporting a TRT demographically independent population; PCEs quantity very limited in this HUC5 but a priority management goal for the Chelan River is to provide spawning and rearing habitat for steelhead in lowermost reach	Medium

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Upper Columbia/Entiat	Entiat River	1702001001	2	2	2	1	2	3	12	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU and overlap with FEMAT key watershed for at-risk anadromous salmonids; this HUC5 contains majority of spawning PCEs for this population	High
	Upper Columbia/Entiat	Lake Entiat	1702001002	1	2	1	1	2	3	10	Moderate HUC5 score; rearing/migration PCEs support four TRT populations making the Columbia River a high value connectivity corridor in this HUC5; medium rating associated with relatively limited tributary PCEs in this HUC5	Medium
	Upper Columbia/Entiat	Columbia River/Lynch Coulee	1702001003	1	2	1	3	1	2	10	Moderate HUC5 score; rearing/migration PCEs support four TRT populations making the Columbia River a high value connectivity corridor in this HUC5; HUC5 contains some spawning PCEs and CHART noted that PCEs in this HUC5 may support fish uniquely adapted to high temperatures	High
	Upper Columbia/Entiat	Columbia River/Sand Hollow	1702001004	1	2	1	3	1	2	10	Moderate HUC5 score; rearing/migration PCEs support four TRT populations making the Columbia River a high value connectivity corridor in this HUC5; HUC5 contains some spawning PCEs and CHART noted that PCEs in this HUC5 may support fish uniquely adapted to high temperatures	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Wenatchee	White River	1702001101	3	3	3	2	1	2	14	High HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; high value spawning/rearing PCEs are most extensive in upper watersheds; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids	High
	Wenatchee	Chiwawa River	1702001102	3	3	3	2	2	2	15	Highest HUC5 score for entire ESU; PCEs support one of four TRT demographically independent populations in this ESU; high value spawning/rearing PCEs are most extensive in upper watersheds; PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids	High
	Wenatchee	Nason/Tumwater	1702001103	3	2	2	1	2	2	12	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; high value spawning/rearing PCEs are most extensive in upper watersheds; some PCEs in this HUC5 overlap with FEMAT key watershed for at-risk anadromous salmonids; HUC5 also contains high value rearing/migration PCEs for upstream HUC5s	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Wenatchee	Icicle/Chumstick	1702001104	1	1	2	1	2	2	9	Moderate HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; PCEs overlap with a FEMAT key watershed for at-risk anadromous salmonids; CHART determined that tributary PCEs here were likely of lowest quality and quantity and may not have as high a conservation value as others supporting this population; this HUC5 does contain high value rearing/migration PCEs for upstream HUC5s	Medium
	Wenatchee	Lower Wenatchee River	1702001105	2	2	2	1	2	2	11	Moderate-high HUC5 score; PCEs support one of four TRT demographically independent populations in this ESU; some PCEs overlap with a FEMAT key watershed for at-risk anadromous salmonids; HUC5 contains high value rearing/migration PCEs for all HUC5s supporting this population	High
	Moses Coulee	Rattlesnake Creek	1702001204	1	0	1	0	1	1	4	Low-moderate HUC5 score, lowest of all HUC5s in this ESU; very limited habitat here and HUC5 not identified as part of a TRT demographically independent population	Low
	Lower Crab	Lower Crab Creek	1702001509	1	1	2	2	1	2	9	Moderate HUC5 score; rearing/migration PCEs support one TRT population; HUC5 contains some spawning PCEs and CHART noted that PCEs in this HUC5 may support fish uniquely adapted to high temperatures	Medium

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Upper Columbia/Priest Rapids	Yakima/Hansen Creek	1702001604	1	2	1	3	1	2	10	Moderate HUC5 score; rearing/migration PCEs support all TRT populations making the Columbia River a high value connectivity corridor in this HUC5; HUC5 contains some spawning PCEs (including tributaries) and CHART noted that PCEs in this HUC5 may support fish uniquely adapted to high temperatures	High
	Upper Columbia/Priest Rapids	Middle Columbia/Priest Rapids	1702001605	2	2	1	1	1	2	9	Moderate HUC5 score; rearing/migration PCEs support all TRT populations making the Columbia River a high value connectivity corridor in this HUC5; CHART noted that this HUC5 likely unique in that it contains mainstem spawning PCEs	High
	Upper Columbia/Priest Rapids	Columbia River/Zintel Canyon	1702001606	2	2	1	1	1	2	9	Moderate HUC5 score; rearing/migration PCEs support all TRT populations making the Columbia River a high value connectivity corridor in this HUC5; CHART noted that this HUC5 likely unique in that it contains mainstem spawning PCEs	High
	Middle Columbia/Lake Wallula	Upper Lake Wallula	1707010101							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Middle Columbia/Lake Wallula	Lower Lake Wallula	1707010102							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High

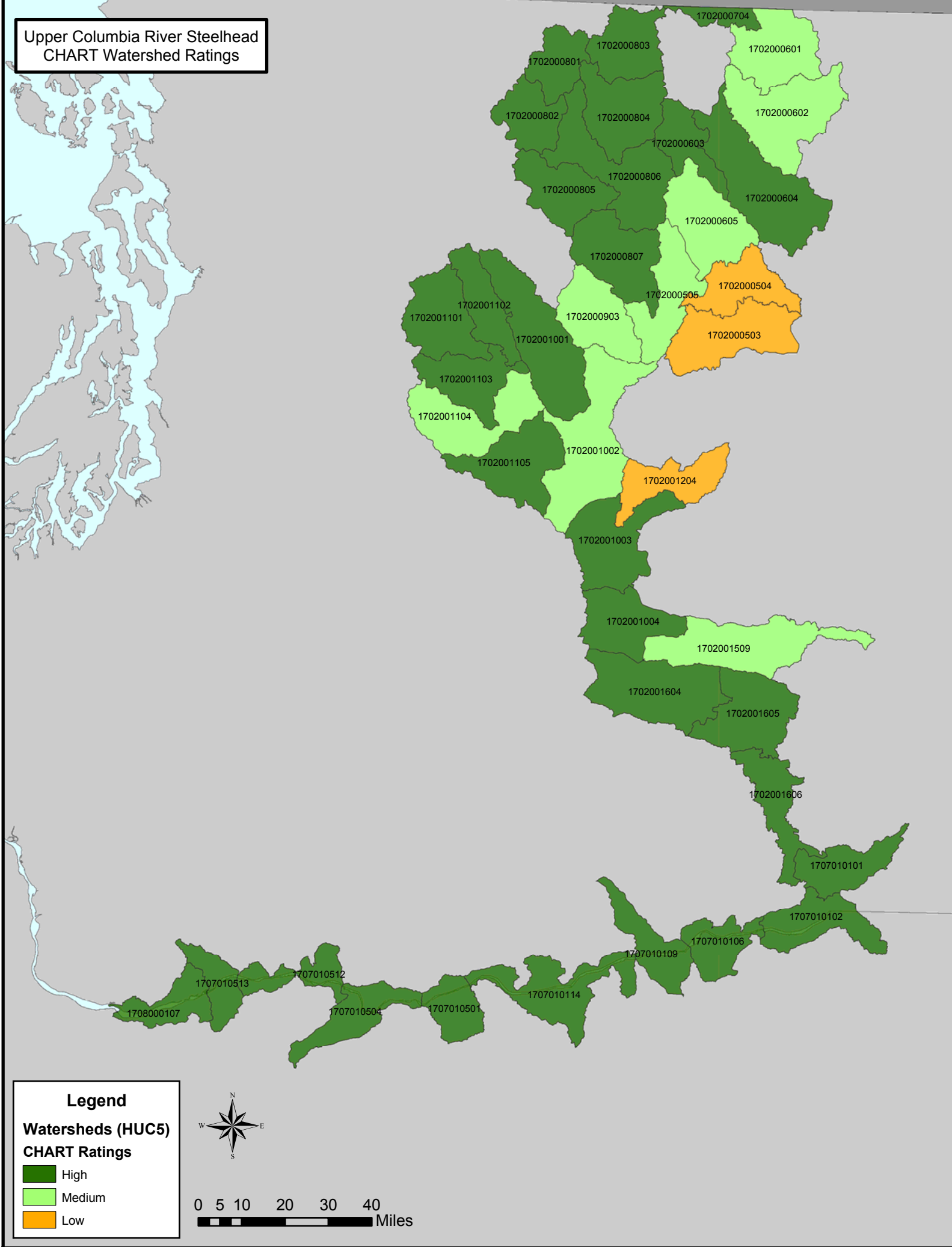
Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Middle Columbia/Lake Wallula	Upper Lake Umatilla	1707010106							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Middle Columbia/Lake Wallula	Middle Lake Umatilla	1707010109							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Middle Columbia/Lake Wallula	Lower Lake Umatilla	1707010114							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Middle Columbia/Hood	Upper Middle Columbia/Hood	1707010501							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Middle Columbia/Hood	Middle Columbia/Mill Creek	1707010504							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Middle Columbia/Hood	Middle Columbia/Grays Creek	1707010512							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High

Map Code	Subbasin	Area/ Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/ Other Considerations	CHART Rating of HUC5 Conservation Value
				1	2	3	4	5	6			
	Middle Columbia/Hood	Middle Columbia/Eagle Creek	1707010513							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Lower Columbia/Sandy	Columbia Gorge Tributaries	1708000107							NS	HUC5 not scored since it is part of the migration corridor. The CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation.	High
	Multiple	Lower Columbia Corridor (Sandy/Washougal to Ocean) corridor	NA							NS	Area not scored since CHART concluded that rearing and migration PCEs throughout this corridor are highly essential to ESU conservation	High

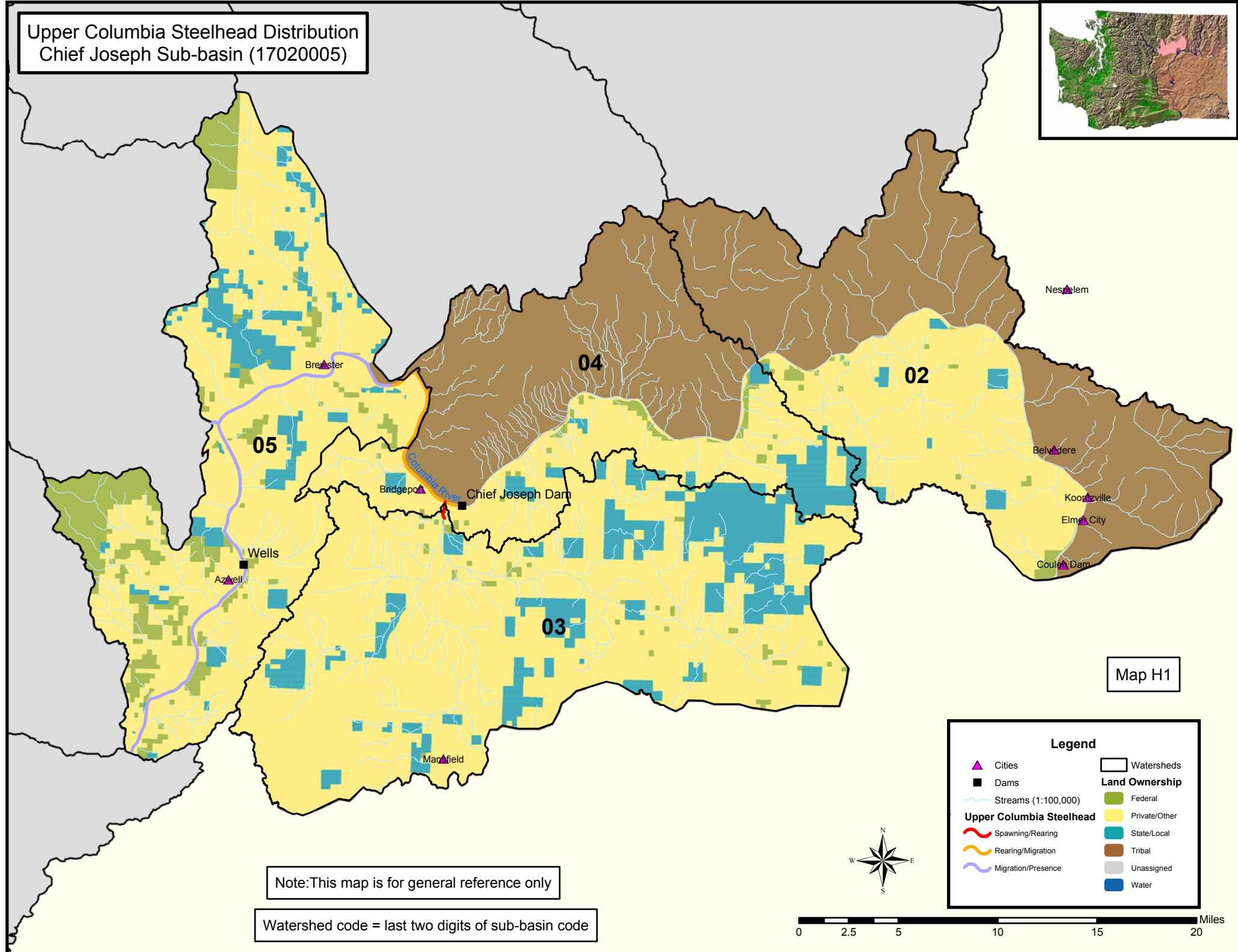
* Indicates that HUC5 may contain additional occupied areas or contain blocked/inaccessible areas that the CHART concluded may be essential for ESU conservation. See Unit Description text for specific areas considered.

Figure H1. CHART Ratings of Conservation Value for Habitat Areas in HUC5 Watersheds Occupied by the Upper Columbia River Steelhead ESU

Upper Columbia River Steelhead
CHART Watershed Ratings



Upper Columbia Steelhead Distribution Chief Joseph Sub-basin (17020005)



Map H1

Note: This map is for general reference only

Watershed code = last two digits of sub-basin code

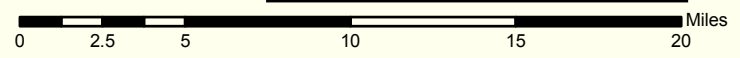
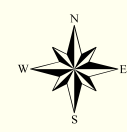
Legend

- Cities
- Dams
- Streams (1:100,000)
- Upper Columbia Steelhead
 - Spawning/Rearing
 - Rearing/Migration
 - Migration/Presence

Land Ownership

- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water

Watersheds



Upper Columbia Steelhead Distribution Okanogan Sub-basin (17020006)

Map H2



Legend

▲ Cities

■ Dams

~ Streams (1:100,000)

Upper Columbia Steelhead

— Spawning/Rearing

— Rearing/Migration

— Migration/Presence

Watersheds

Land Ownership

Federal

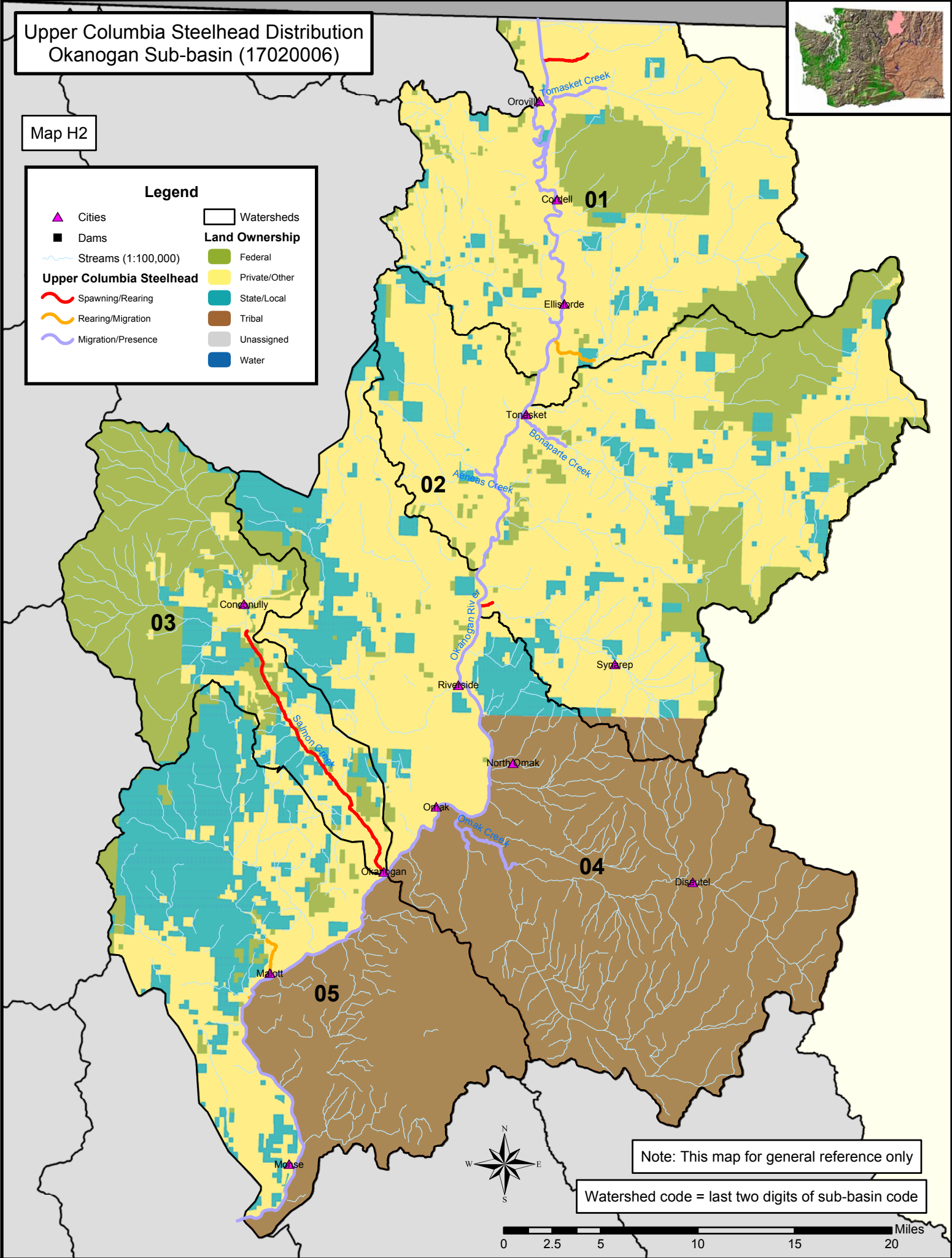
Private/Other

State/Local

Tribal

Unassigned

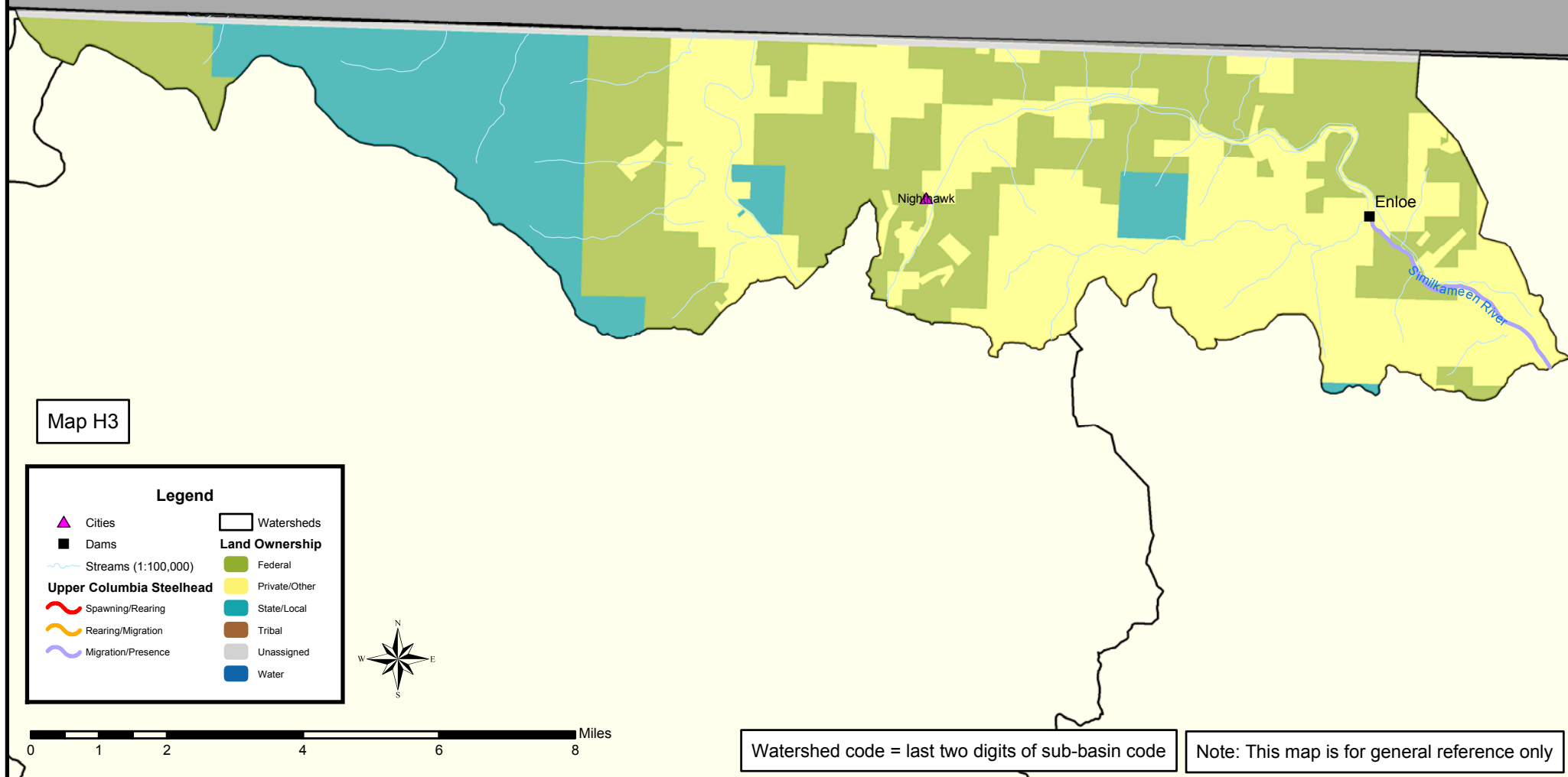
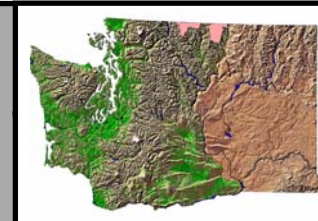
Water



Note: This map for general reference only

Watershed code = last two digits of sub-basin code

Upper Columbia Steelhead Distribution Similkameen Sub-basin (17020007)



Map H3

Legend

- Cities
- Dams
- Streams (1:100,000)
- Upper Columbia Steelhead**
 - Spawning/Rearing
 - Rearing/Migration
 - Migration/Presence

Land Ownership

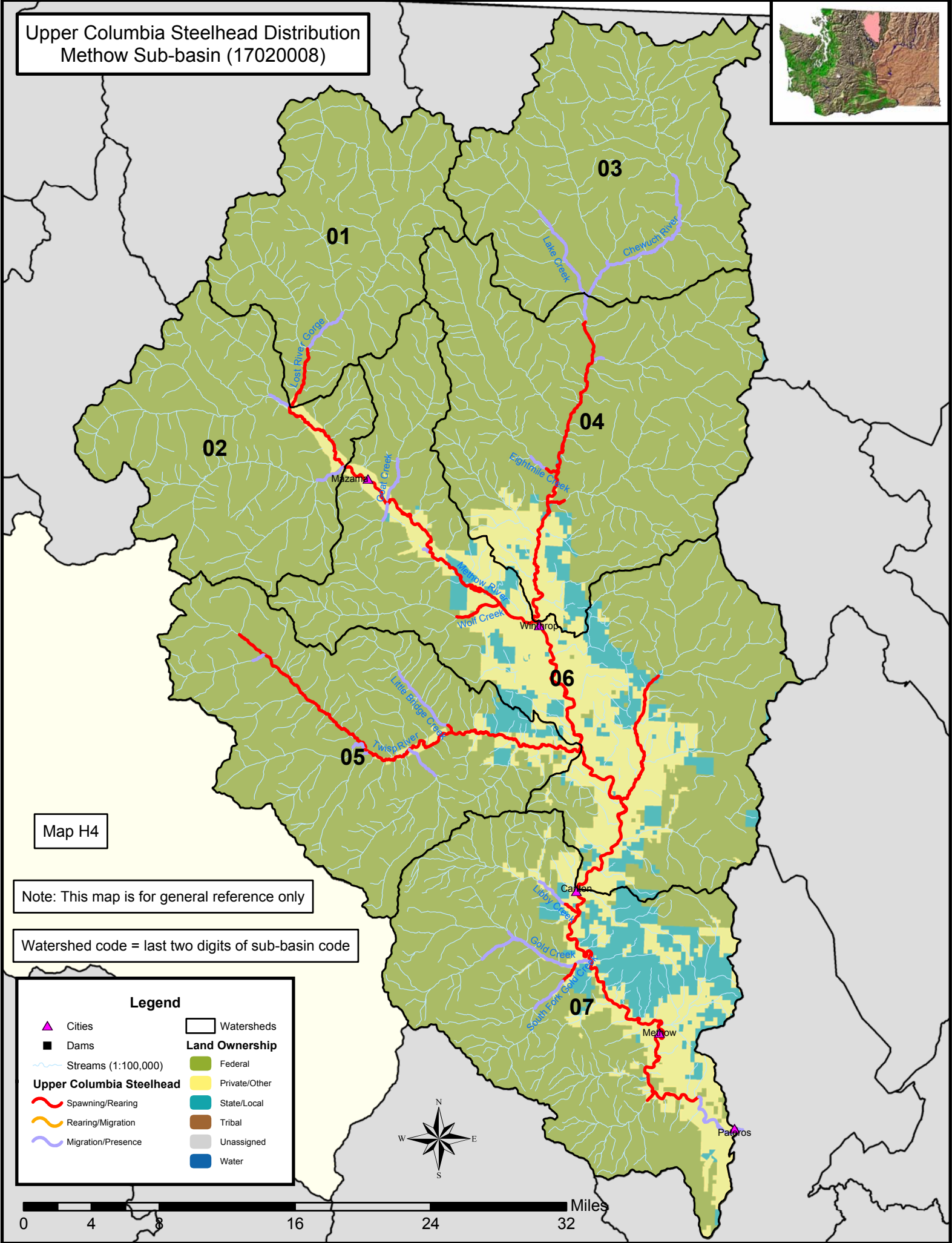
- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water

Watersheds

Watershed code = last two digits of sub-basin code

Note: This map is for general reference only

Upper Columbia Steelhead Distribution Methow Sub-basin (17020008)



Map H4

Note: This map is for general reference only

Watershed code = last two digits of sub-basin code

Legend

- Cities
- Dams
- Streams (1:100,000)

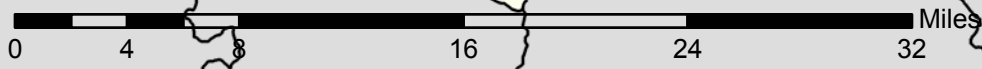
Upper Columbia Steelhead

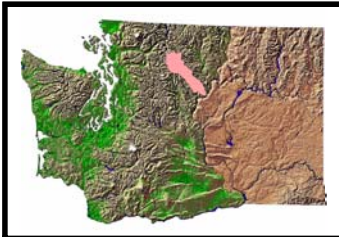
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence

Watersheds

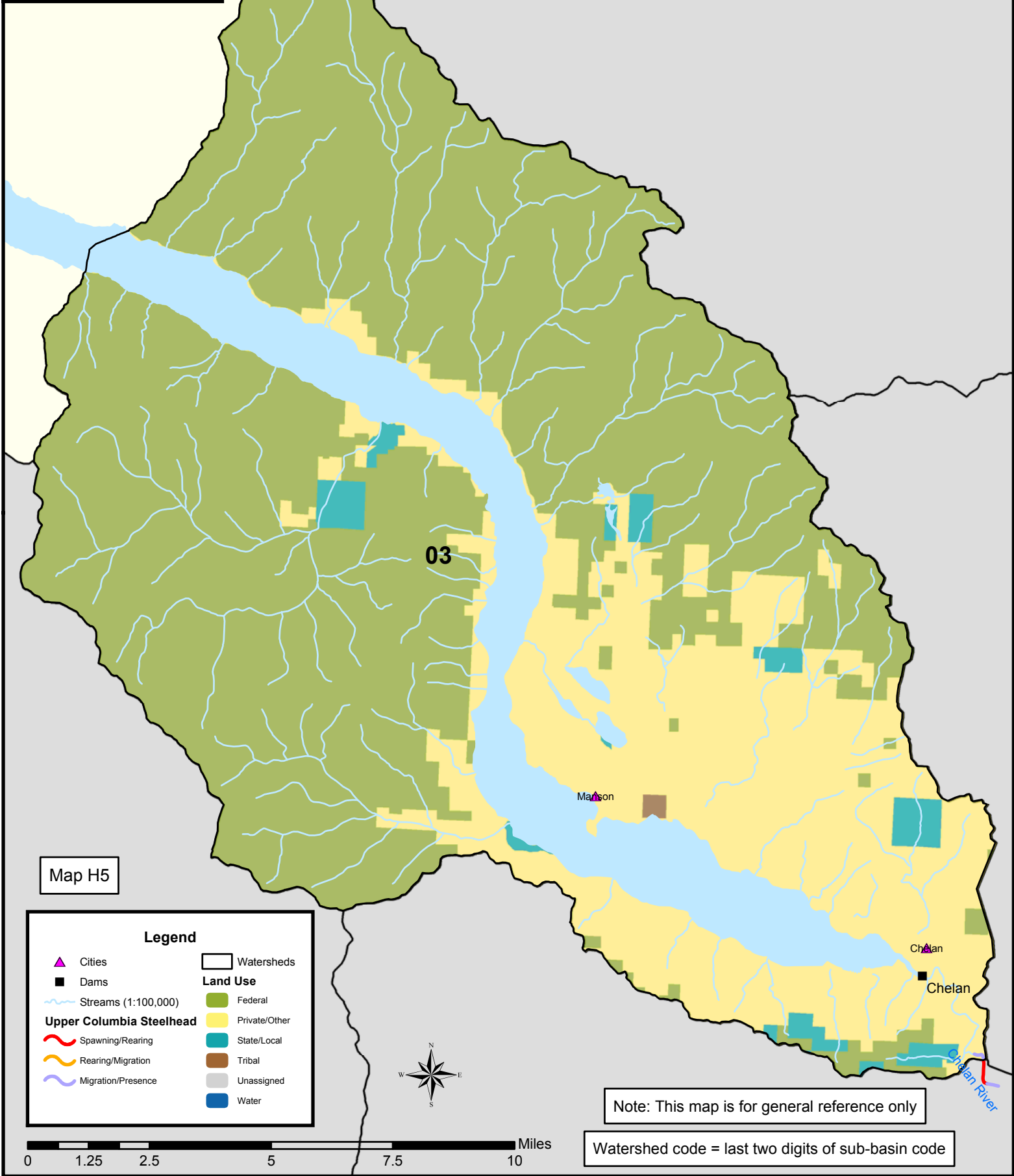
Land Ownership

- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water



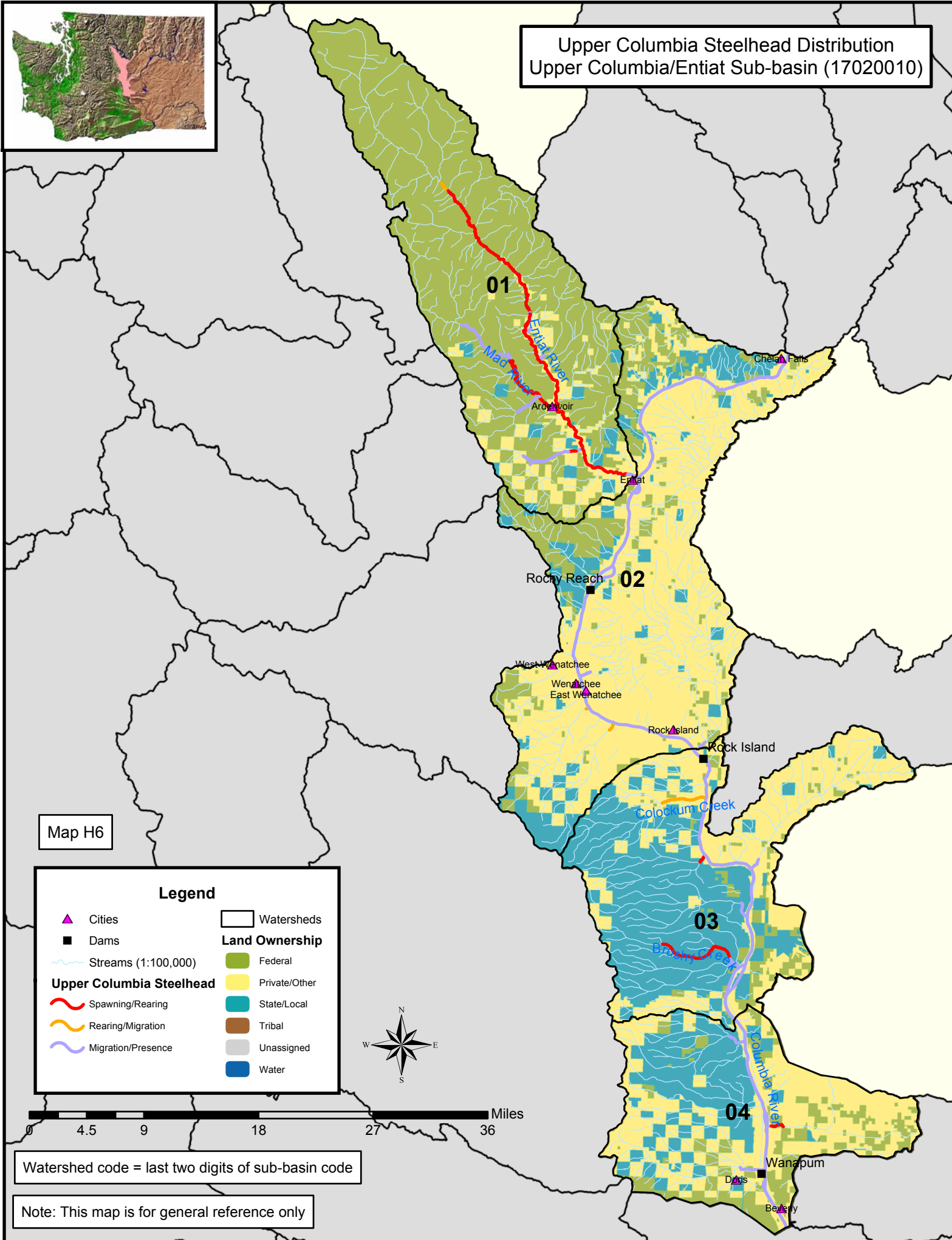


Upper Columbia Steelhead Distribution
Lake Chelan Sub-basin 17020009





Upper Columbia Steelhead Distribution
Upper Columbia/Entiat Sub-basin (17020010)



Map H6

Legend

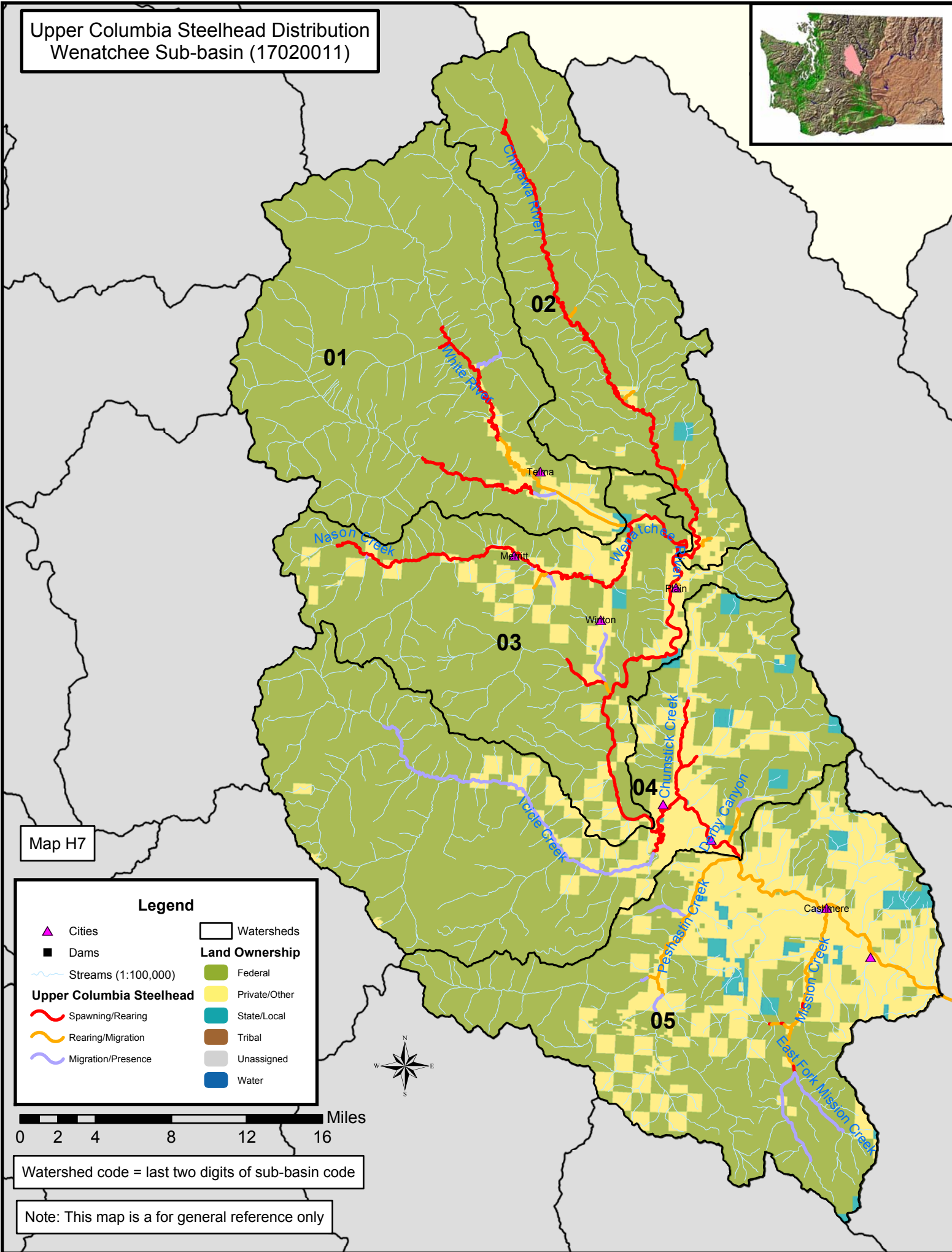
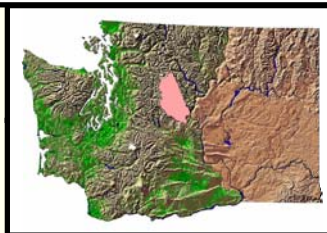
Cities	Dams	Watersheds
Streams (1:100,000)	Federal	Land Ownership
Spawning/Rearing	Private/Other	State/Local
Rearing/Migration	Tribal	Unassigned
Migration/Presence	Water	

Upper Columbia Steelhead

Watershed code = last two digits of sub-basin code

Note: This map is for general reference only

Upper Columbia Steelhead Distribution Wenatchee Sub-basin (17020011)



Map H7

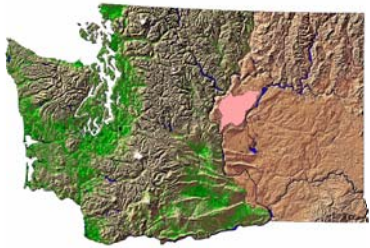
Legend

- | | |
|---------------------------------|-----------------------|
| ▲ Cities | Watersheds |
| ■ Dams | |
| Streams (1:100,000) | Land Ownership |
| Upper Columbia Steelhead | Federal |
| Spawning/Rearing | Private/Other |
| Rearing/Migration | State/Local |
| Migration/Presence | Tribal |
| | Unassigned |
| | Water |

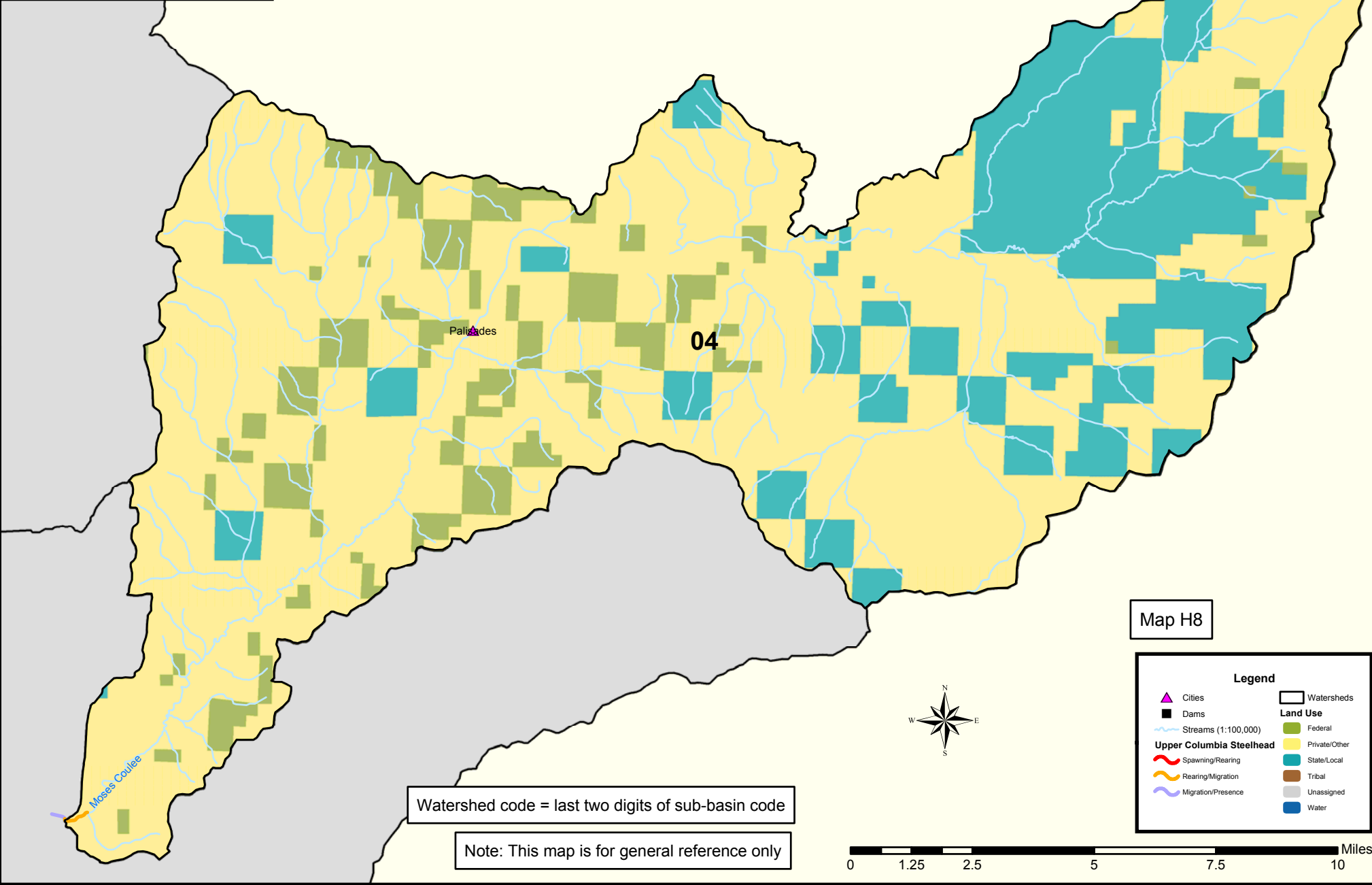
0 2 4 8 12 16 Miles

Watershed code = last two digits of sub-basin code

Note: This map is a for general reference only



Upper Columbia Steelhead Distribution
Moses Coulee Sub-basin (17020012)



Palisades

04

Map H8

Legend

▲ Cities

■ Dams

~ Streams (1:100,000)

Upper Columbia Steelhead

- Spawning/Rearing
- Rearing/Migration
- Migration/Presence

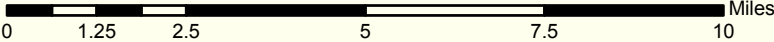
Watersheds

Land Use

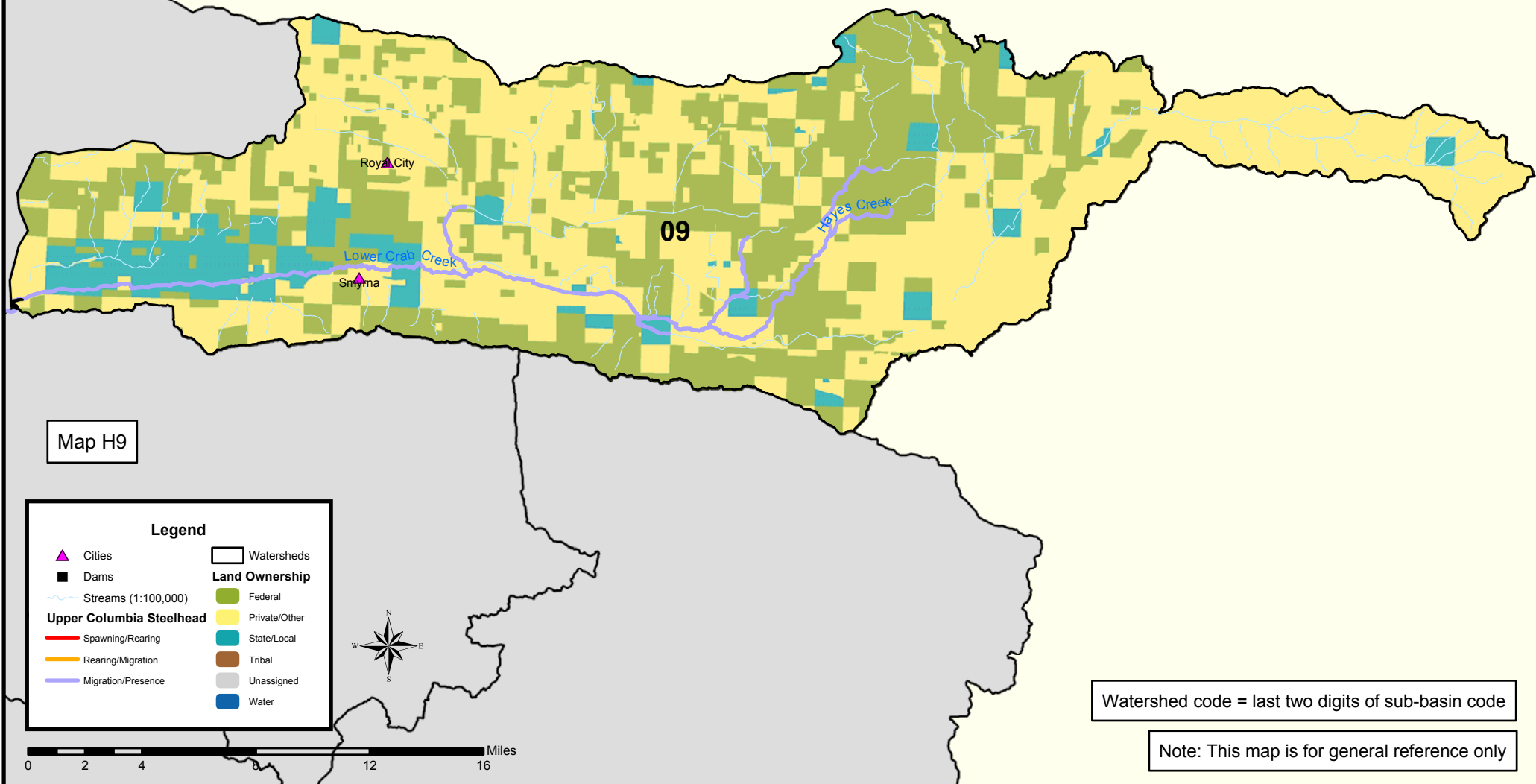
- Federal
- Private/Other
- State/Local
- Tribal
- Unassigned
- Water

Watershed code = last two digits of sub-basin code

Note: This map is for general reference only



Upper Columbia Steelhead Distribution
Lower Crab Sub-basin (17020015)



Map H9

Legend

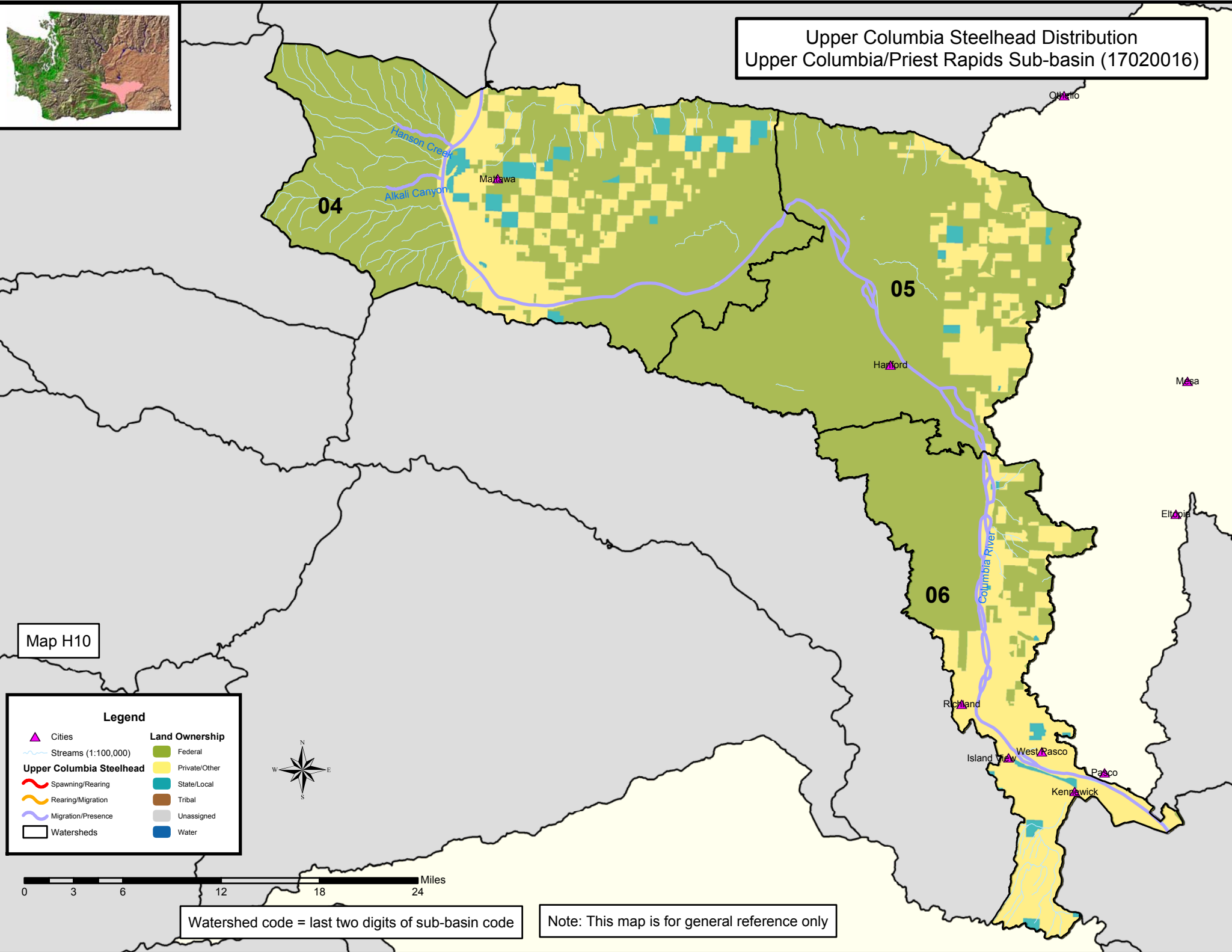
Cities	Watersheds
Dams	Land Ownership
Streams (1:100,000)	Federal
Upper Columbia Steelhead	Private/Other
Spawning/Rearing	State/Local
Rearing/Migration	Tribal
Migration/Presence	Unassigned
	Water

Watershed code = last two digits of sub-basin code

Note: This map is for general reference only



Upper Columbia Steelhead Distribution
Upper Columbia/Priest Rapids Sub-basin (17020016)



Map H10

Legend

Cities

Streams (1:100,000)

Spawning/Rearing

Rearing/Migration

Migration/Presence

Watersheds

Land Ownership

Federal

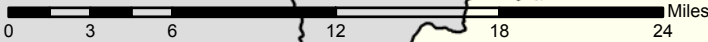
Private/Other

State/Local

Tribal

Unassigned

Water



Watershed code = last two digits of sub-basin code

Note: This map is for general reference only